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RadiCentre®

Product Manual



Modular EMC test system

Contains up to seven independent plug-in cards

Models:
CTR1009B
CTR1004B
CTR1001S

RadiCentre® Product Manual

This service and operating manual pertains to the RadiCentre® system.

Models: CTR1009B, CTR1004B and CTR1001S.

Made by DARE!! Instruments.

We ask that you read this manual carefully before operating your new product and adhere to any safety instructions it might contain.

A Quick Start Guide has been added to this product for your convenience. This double printed A4 sheet contains the basic start-up steps and the safety warnings for the RadiCentre®.

Please keep the Quick Start Guide (and this regular manual) close at hand when you operate your new RadiCentre®.

Please contact DARE!! Instruments or your local reseller if you have any questions.

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WARNINGS & PRECAUTIONS



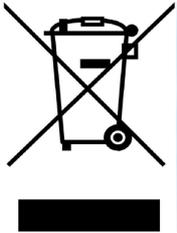
Read the contents of this manual and become familiar with the safety markings, instructions, operation and handling of the system.



Become familiar with the contents of the manuals of all the different plug-in cards mounted in the RadiCentre® system.



Only qualified service personnel is allowed to carry out adjustments, maintenance or repairs on the equipment.



The RadiCentre® contains materials that can be recycled and reused to minimize material waste. At the 'end-of-life', specialized companies can dismantle the discarded system to collect the reusable and recyclable materials. If your product is discarded at its 'end-of-life', please return it to your local reseller for recycling.



The RadiCentre® requires a protective earth connection. The mains power source for the equipment must supply an uninterrupted safety ground to the IEC input connector.

NEVER USE THIS EQUIPMENT WITHOUT AN EARTH CONNECTION!

WARNINGS & PRECAUTIONS



Please make sure that (at least) one slot of 1U height is kept empty below the RadiCentre® CTR1009B and CTR1004B models, to ensure sufficient cooling of the system through the bottom air inlets of the cabinet.



Special attention should be given to the plug-in cards that involve the use of fiber optic cables and LASERS.

Please read the documentation and safety instructions as supplied with these plug-in cards!



Verify that your mains voltage is within the operating range of the equipment.



To make the RadiCentre® system as safe as possible, each plug-in card has its own primary safety system that is designed to work with the RadiCentre®.

In addition, the RadiCentre® has its own safety interlock system which is connected, in series, with the interlock system of every plug-in card that is installed in the system.

1 Introduction

1.1 Product Introduction

EMC test systems can vary, from simple systems with one or two instruments, to complex installations with several integrated measurement instruments. Often even turntables and antennas should be controlled. To enable fully automated testing, these devices, as well as the connections between amplifiers, power meters, antennas and measurement receivers, need to be controlled in an automated manner.

With the introduction of the RadiCentre®, cost effective, fully automated testing has finally become a reality. The RadiCentre® is designed for flexible configuration of an EMC test facility and contains up to seven independent slots that can contain a mix of different available plug-in cards. These cards determine the test facilities and are controlled through the RadiCentre®, possibly in combination with the RadiMation® software.

1.2 Related Products



RadiMation® software

RadiMation® is the EMC software package from DARE!! Instruments used for remote control and automated testing of the RadiCentre® plug-in cards and modules (such as the RadiField® system).

1.2.1 Available plug-in cards

The RadiCentre® can be expanded with many different plug-in cards. The following cards are available:



RadiControl®

A versatile antenna tower and turntable controller.

RadiField®

Power supply plug-in card to power the Triple A, this card fills two slots.



RadiGen®

A range of EMC signal generators, from 9 kHz to 6 GHz.

RadiLink®

A range of analogue fiber optic RF links, up to 3 GHz.



RadiPower®

A four channel USB plug-in card for a range of power meters for EMC and RF applications, at 6 and 18 GHz.

RadiSupply®

Power supply plug-in card for battery free, laser powered, RadiSense® EM Field Sensors, at 4, 6 and 18 GHz.



RadiSwitch®

A range of coaxial switch plug-in cards with SMA, N-type and K-type relays up to 40 GHz.

2 The RadiCentre®

2.1 Product Characteristics

Flexible - To enable fully automated testing, the RadiCentre® (model CTR1009B) contains seven versatile slots. These slots can be configured at the user's choice. The different available plug-in cards can be combined as desired, allowing any combination of cards.

Easy to Use & Maintain - The system is 'Plug and Play', which means that every card is automatically recognized, initialized and ready for use. The user can configure and control the system with the TFT touchscreen (models CTR1009B and CTR1004B). Both hardware and software updates can be done by the user, allowing for easy maintenance.

Space Efficient - Where normal controllers, probes, switches and other equipment require one or more slots in a 19" cabinet, the RadiCentre® allows the user to use up to seven devices in just three height units (models CTR1009B and CTR1004B).

Linux Based & Software Upgrades - The RadiCentre® system contains a Vortex embedded main processor to control all the plug-in cards and to interface with the user and/or an external computer. The operating system of the RadiCentre® is LINUX based, resulting in an extreme stable operating environment with a fast start up time and high performance. All the embedded software is stored in flash, making it very easy to upgrade the system with new versions and future functionality.

2.2 Components

The RadiCentre® is delivered with the following items:

- The RadiCentre® mainframe, model: CTR1009B, CTR1004B or CTR1001S
- RS232 cable, USB cable
- Interlock connector: Binder 3-way plug (for the 1S) or ¼" stereo jack (for the 9B/4B)
- Mains power lead (for the 9B/4B) or mains power adapter (for the 1S)
- Set of 19" mounting brackets (for the 9B/4B)
- USB stick containing the (digital) User Manual and Quick Start Guide
- Hardcopy of the Quick Start Guide

2.3 Different Models

The RadiCentre® is available in three models; the CTR1009B (Standard), CTR1004B (Lite) and CTR1001S (Single). The differences between these models derive from the amount of plug-in cards they can hold.



RadiCentre® CTR1009B

The RadiCentre® CTR1009B is the standard version of the RadiCentre®. It provides free space for up to seven plug-in cards in a desktop model with touchscreen. This model can also fit within a 19" rack mount enclosure, (GPIB optional).



RadiCentre® CTR1004B

The RadiCentre® Lite provides free space for up to two plug-in cards in a desktop model with touchscreen. This model can also fit within a 19" rack mount enclosure, (GPIB optional).



RadiCentre® CTR1001S

The RadiCentre® Single is the entry version of the RadiCentre®. It provides space for one plug-in card in a table top enclosure. To minimize the cost of the RadiCentre® Single, local controls, such as a touchscreen display, are not included in this model.

The details of these models will be provided in the following chapters. Please read the chapter(s) applicable to your RadiCentre® model(s).

2.4 RadiCentre® Single – Slot Version

The RadiCentre® Single – Slot (CTR1001S) is the entry version of the RadiCentre®. It provides space for one plug-in card¹ in a table top enclosure. To minimize the cost of the RadiCentre® Single, local controls, such as a touchscreen, are not included in this model.

The plug-in card is inserted in the front of the RadiCentre® Single. Each card that can be inserted in the RadiCentre® Single can act as a USB device on your computer. A virtual COM-port will appear after installation of the USB driver. Use port settings: 115200,8,N,1 for this port.

The back panel of the RadiCentre® Single contains all the cable connections. The power switch and DC-input can be found on this panel. The RadiCentre® Single is powered by an external 12V/2A mains AC/DC adapter, which is delivered (as standard) with the system.

Two communication ports are located at the middle of the back panel:

- One (Holaday compatible) serial port with settings: 9600,7,Odd,1
- One USB-B connector.

The interlock connector and a push button to start the LASER are located at the top of the back panel. (Use of the LASER button is only applicable when used with a RadiSense® sensor.)



Figure 1: CTR1001S (with LPS1001A plug-in card and RadiSense® 4 GHz field sensor on the left)

¹ With the exception of the: RadiField®, RadiGen® and RadiSwitch® RSW1061/1062 plug-in cards.

2.5 RadiCentre® 2 – Slot / 7 – Slot versions

The Standard (7 – slot, CTR1009B) and Lite (2 – slot, CTR1004B) RadiCentre® systems are both 3U high and are standard delivered as a desktop model. They fit within a 19” rack mount enclosure when using the 19” brackets that are supplied.

The main difference between these two models is the amount of slots. The RadiCentre® Standard has nine slots and the RadiCentre® Lite has four. Each model has a number of free slots (for custom selectable plug-in cards) and two dedicated slots.

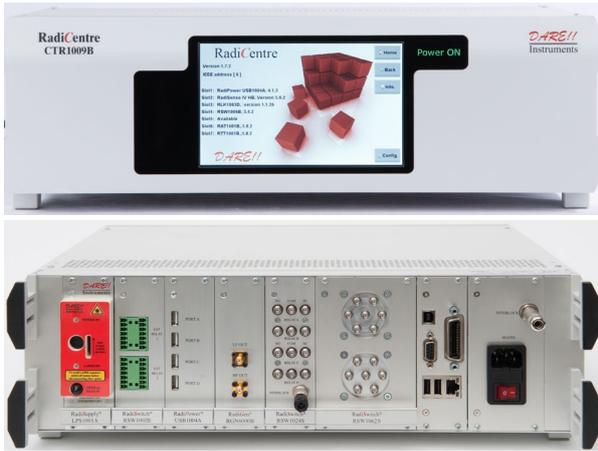
The slots are numbered from left to right (when looking at the back panel). For the RadiCentre® Standard (with nine slots), this means that slots 1-7 are free and slots 8-9 are dedicated to standard components. For the RadiCentre® Lite (with four slots), this means that slots 1-2 are free and slots 3-4 are dedicated.

The dedicated slots are used for the embedded Linux computer (CPU plug-in cards) and power supply plug-in cards. These plug-in cards cannot be placed in any other slot. The power supply plug-in card also has a connection for an external interlock. The processor plug-in card has several interfaces to control the RadiCentre® such as Ethernet, USB, RS232 and GPIB (optional).

Both models are controlled by the user through the touchscreen on the front panel or by remote control through a Windows® computer.



Slot # 1
|



Slot # 1
|

Figure 2: RadiCentre® Lite (top) and Standard (bottom)

2.5.1 Back panel of the RadiCentre® (Standard and Lite models)

The following is an overview of the back panel and its connections. More information about these connections and their communication settings can be found in the following chapters.

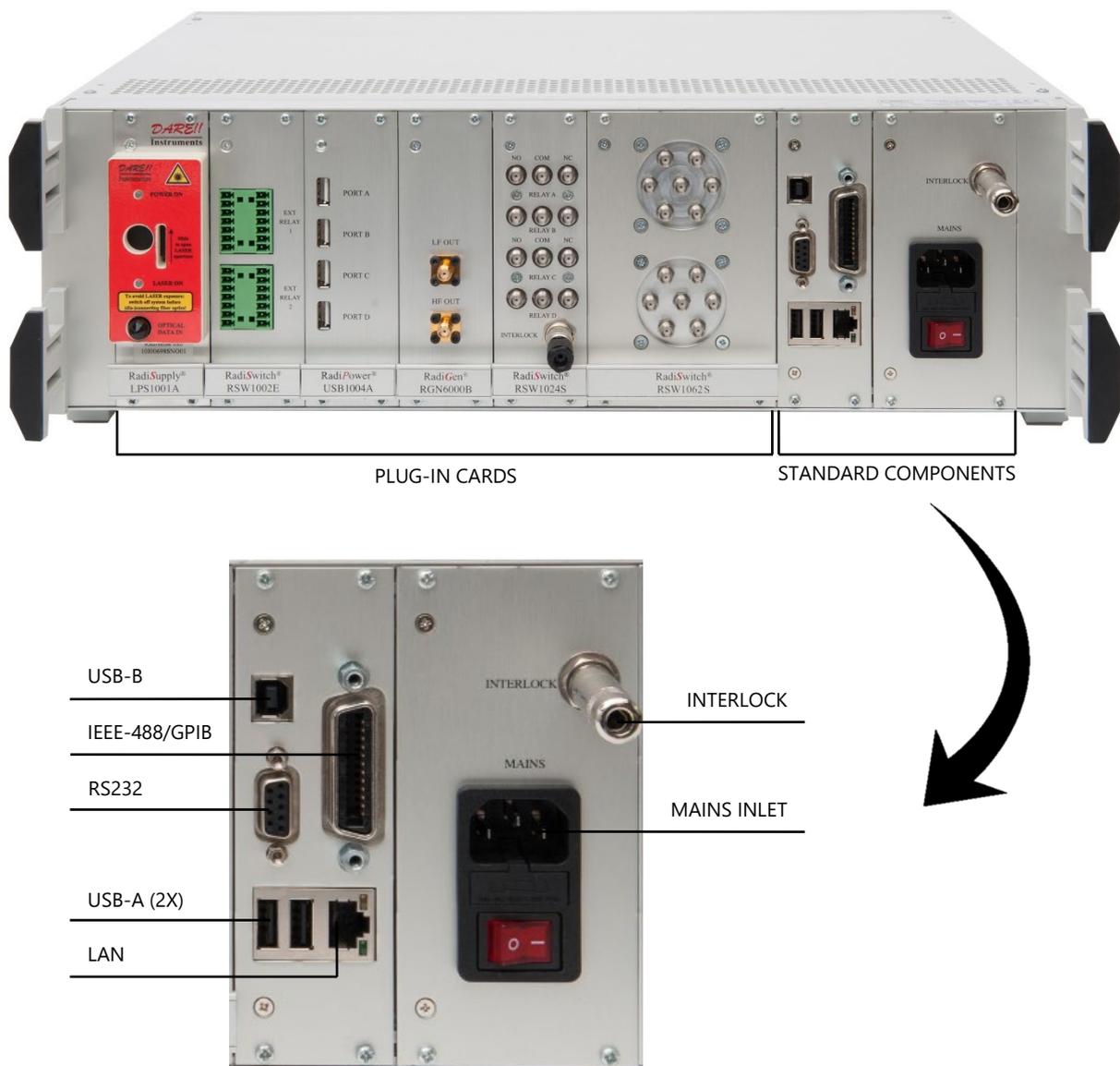


Figure 3: RadiCentre® CTR1009B back panel and connections

2.5.2 Connections on the RadiCentre® (Standard and Lite models)

RS232	Serial interface bus (RS232) to interface with a computer. Use a straight cable with standard supplied sub-D9 connectors.
IEEE-488/GPIB	IEEE-488.2 interface bus to interface with a computer (optional).
LAN	Local Area Network connection.
USB-A (2x)	USB device connection. Can be used to update the RadiCentre® software using a USB memory stick.
USB-B	The RadiCentre® can act as a USB-device if connected to a computer. After installation of the device driver, a virtual com-port will be present.
INTERLOCK	Safety interlock connection. The interlock connector provides two floating contacts which require shorting for the system to operate. Use the supplied connector (6,3mm ¼" stereo jack) to wire to the emergency switch of your site. Connect the tip and middle pin.
Mains inlet	Used to connect the mains power with the CTR1009B or CTR1004B. This IEC inlet holds a primary fuse. When replacing the fuse, always use the correct fuse. The mains power switch is also located on the IEC inlet.

2.5.3 Communication Settings

The communication ports of the RadiCentre® models use the following port setting:

RadiCentre®	RS232 – sub D	USB Virtual Com Port (VCP)
CTR1009B	57600,8,N,1	115200,8,N,1
CTR1004B	57600,8,N,1	115200,8,N,1
CTR1001S	9600,7,Odd,1*	115200,8,N,1

* This port is a Holaday compatible port.

2.5.4 Front panel of the RadiCentre® (Standard and Lite models)

The RadiCentre® front panel contains a 7" widescreen color TFT touchscreen that is used to visualize and control the status of all the installed plug-in cards.

Next to the screen are four LED indicators that communicate the system status:

- The "STANDBY" LED appears next to the lower left side of the screen and lights up while the system is in standby mode.
- The "POWER ON" LED appears next to the upper right side of the screen and lights up as soon as the system is switched on.
- The "LASER ON" LED appears next to the lower left side of the screen and lights up when (one or more of) the LASERS in (one or more of) the laser powered plug-in cards (such as the RadiSupply® for the RadiSense®) is active.

WARNING! - For safety reasons, never disconnect the fiber optic cables when one of the LASERS is switched on.

- The "INTERLOCK" LED appears next to the lower left side of the screen and lights up if the external interlock is open, or if there is an interlock error in one of the plug-in cards.



Figure 4: RadiCentre® CTR1009B front panel

3 Installation

3.1 Hardware Configuration

The hardware configuration is carried out in the following steps:

1. Make sure that all the connections to the plug-in cards are made as described in the manuals for these plug-in cards (please read these manuals carefully).
2. Make sure that the remote interlock connection of the RadiCentre® system is closed.
3. Depending on your model, plug the mains cord into the mains inlet of the RadiCentre® (Standard or Lite) system or connect the mains adapter to the RadiCentre® Single.
4. For the Single model, switch the main power switch, on the mains inlet, to the 'ON' position.
5. For the Standard and Lite models, press (any point on) the front panel touchscreen to activate the RadiCentre®.

The RadiCentre® will automatically detect the installed plug-in cards and will display their controls on the display.

The system is now ready to be used.

In the case of the Standard and Lite models, the user can control the different plug-in cards through the touchscreen of the RadiCentre® system.

The main screen will display the slot locations and the plug-in cards located in these slots. These indications can be used to open the screens of the individual plug-in cards where the main parameters for these cards are visible.

REMINDER - Please make sure that (at least) one slot of 1U height is kept empty below the RadiCentre® CTR1009B and CTR1004B models, to allow for sufficient cooling of the system through the bottom air inlets of the cabinet.

3.2 Software Configuration

In order to control the RadiCentre® from a computer, one can use either custom made software or the RadiMation® EMC software package from DARE!! Instruments (to be purchased separately). If the RadiCentre® is operated manually, this chapter can be skipped.

If RadiMation® software is used, select the required device driver for each plug-in card installed in the RadiCentre®.

Example - If a system contains two RadiSense® cards and one RadiSwitch® card, the following drivers must be configured in RadiMation®:

- One probe driver for the RadiSense® / RadiCentre®, to control probe 1
- One probe driver for the RadiSense® / RadiCentre®, to control probe 2
- One switch matrix driver for the RadiSwitch® / RadiCentre® to control the coax relays card

3.2.1 RadiMation® software

The following is an example with regards to the configuration of RadiMation® software used to remote control the devices in your RadiCentre®. Please consult your RadiMation® software manual for more information.

Example - Configure the RadiMation® software for a RadiSense® / RadiCentre® field sensor.

1. Configure a device driver and select the correct communication port.
2. In the 'equipment list' that you are using, select the 'field sensor device' driver.
3. Open a Test Set-up File (TSF) and click on the 'Inputs' button. Select the field sensor(s) to be used.
4. Save the TSF.

RadiMation® is now ready to be used with the RadiSense® / RadiCentre® field sensor.

The RadiMation® software package verifies the sensor at the beginning of each test (if a field sensor is selected).

4 Maintenance

4.1 Screen calibration

The RadiCentre® (2 and 7-slot versions) are controlled through a touch screen. This screen can be calibrated² to ensure the best possible quality of use.

Follow the following instructions to calibrate the touch screen:

1. Press 'Config' in the main screen to enter the main configuration screen.
2. Press 'Calibrate Screen' to enter the screen calibration window (see Figure 5).

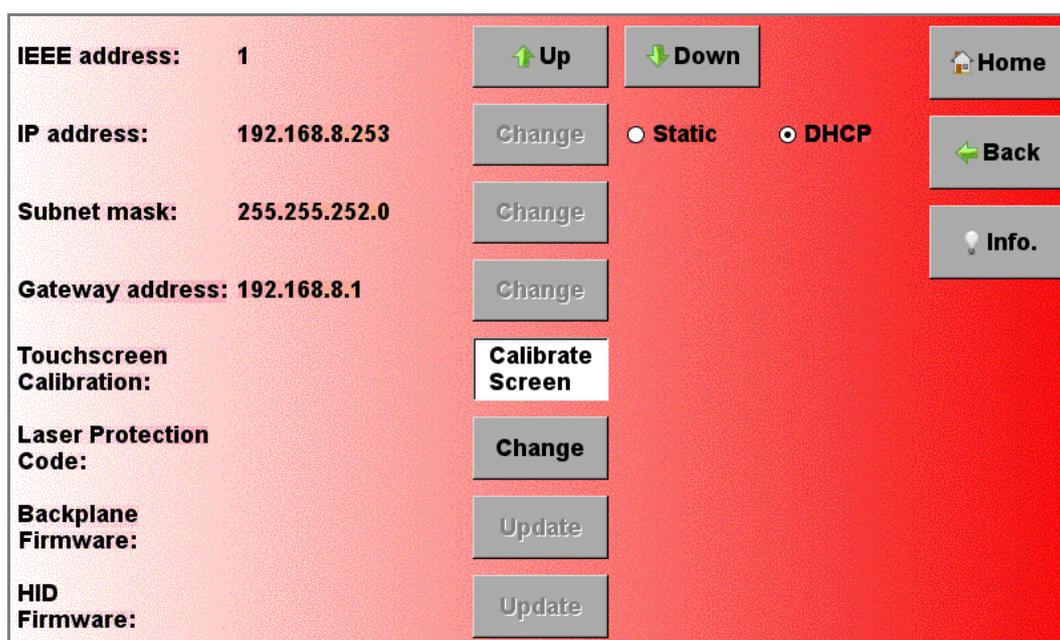


Figure 5: 'Calibrate Screen' button in the main configuration screen

² Please note that the screenshots shown in this manual are related to RadiCentre® v1.16.0. Other version may look different and support other functions.

3. The screen calibration window contains four points (see Figure 6). Touch the area with the red pulsating circles to calibrate the screen. Repeat this action for each of the four points. After an area has been pressed, the circle will turn black.

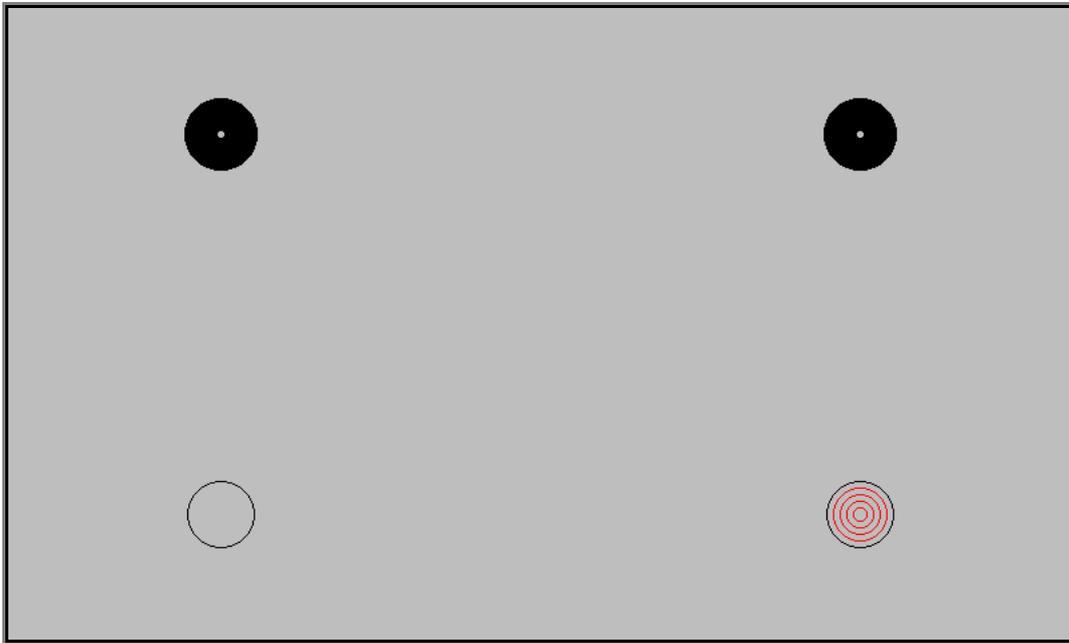


Figure 6: Screen calibration window

4.2 Firmware update procedure

DARE!! Instruments provides the embedded software for their plug-in cards. When a new version of this firmware is released, users can update their firmware themselves, free of charge.

Follow the following instructions to update the firmware of a plug-in card:

1. Press the slot number of the plug-in card to open the slot configuration screen. This button can be found in the main screen, next to the status button of that plug-in card.

The slot configuration screen will display the software version of the plug-in card. If a newer software version is available, the 'Update Embedded Software' button will be enabled. (This button is always present in the screen, but is disabled if there is no new update available.)

2. Press 'Update Embedded Software' to open the software update screen (see Figure 7). A screen dedicated to the software update will appear (see Figure 8).

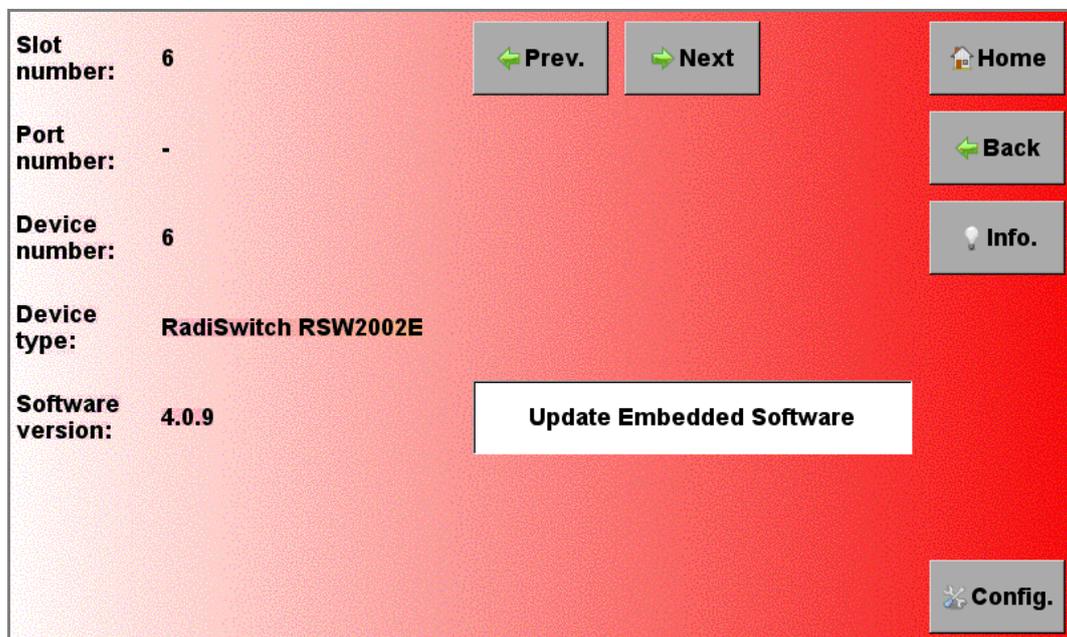


Figure 7: 'Update Embedded Software' button in the slot configuration screen

3. Read and follow the instructions on this screen carefully. Press 'Program' to update the software, or 'Cancel' to cancel or postpone the update. The update progress will be displayed in the screen.

WARNING! - Do not turn off the device during the programming process.

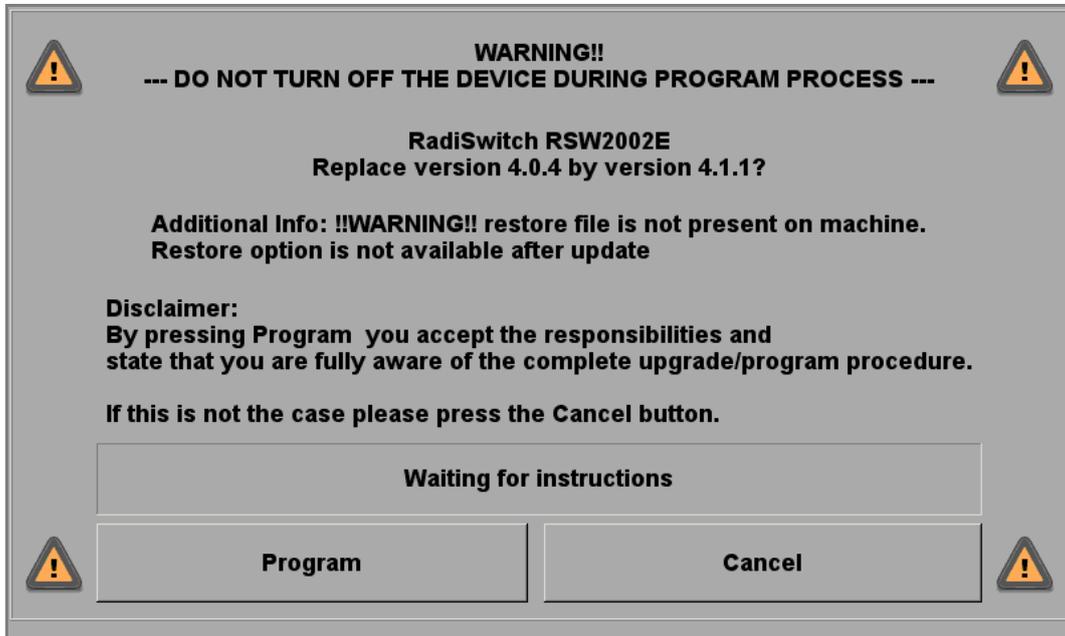


Figure 8: Embedded software update screen

In some situations it is not possible to restore your software to the previous version (downgrade). A notification is visible in the update screen if this is the case.

5. Using the RadiCentre®

5.1 Manual Control of the CTR1001S

Manual control of the RadiCentre® Single is done through the 'ON/OFF' switch and 'START' button on the back panel.

5.1.1 LASER activation

The RadiCentre® Single does not have a touchscreen, as a result the LASER code safety feature cannot be used. Instead a specific activation procedure combined with auditory warnings is used.

To activate the LASER in the RadiCentre® Single, follow these steps:

1. Press the 'Start' button on the back panel (of the RadiCentre®) and hold it.
2. Five loud 'beeps' can be heard; four short followed by one long.
3. On the fifth 'beep' the LASER link is activated and the red 'LASER ON' LED (on the RadiSupply® card) lights up.
4. Release the 'Start' button.

This means that:

- If you want to interrupt the activation process, all you have to do is release the 'Start' button (before the fifth 'beep'). The LASER will not be activated.
- If you are interrupted during the activation process (and release the 'Start' button by accident), the LASER will not be activated.
- If you press the button by accident (and do not wish to activate the LASER), the auditory warning will alert you to this action.

5.2 Manual Control of the CTR1009B / CTR1004B

Manual control of the RadiCentre® Standard and Lite is done through the touchscreen on the front panel. The following chapters will describe the RadiCentre® user interface.

Please note that the screenshots shown in this manual are related to RadiCentre® firmware v1.16.0. Other versions may look different and support other functions.

5.2.1 Power On

After switching on the RadiCentre® system, the DARE!! logo appears, together with the message “loading operating system”.

5.2.2 ‘Information’ screen

When the operating system has been loaded, the ‘information’ screen appears. This screen is displayed in Figure 9 and contains the following information:

- overview of all detected plug-in cards
- firmware version
- currently configured IEEE address

The ‘info’ screen disappears automatically after approximately 20 seconds and is followed by the ‘main’ screen.

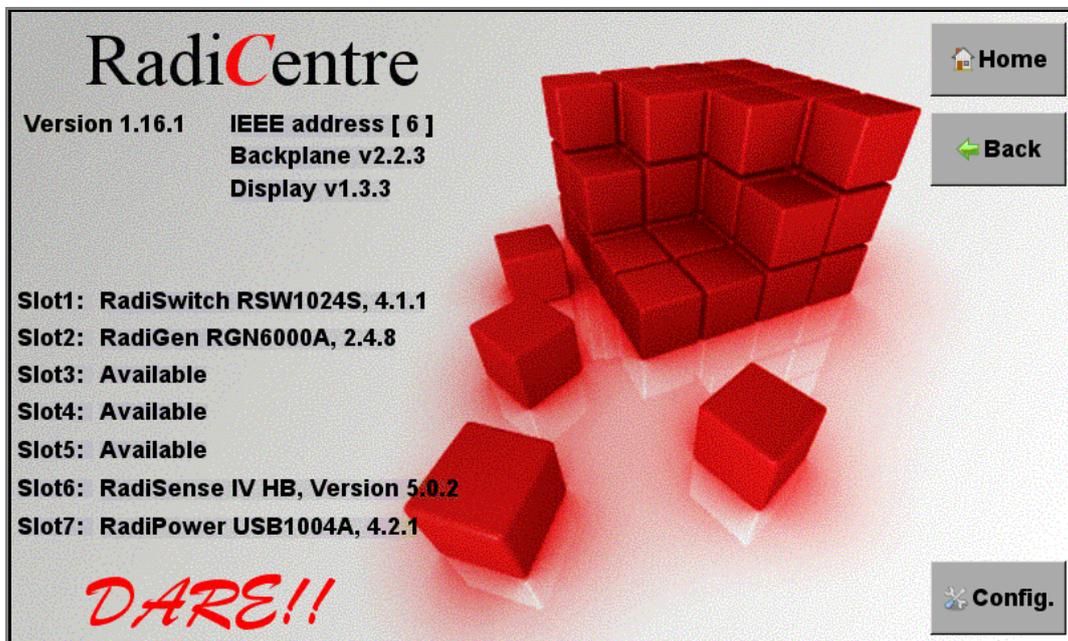


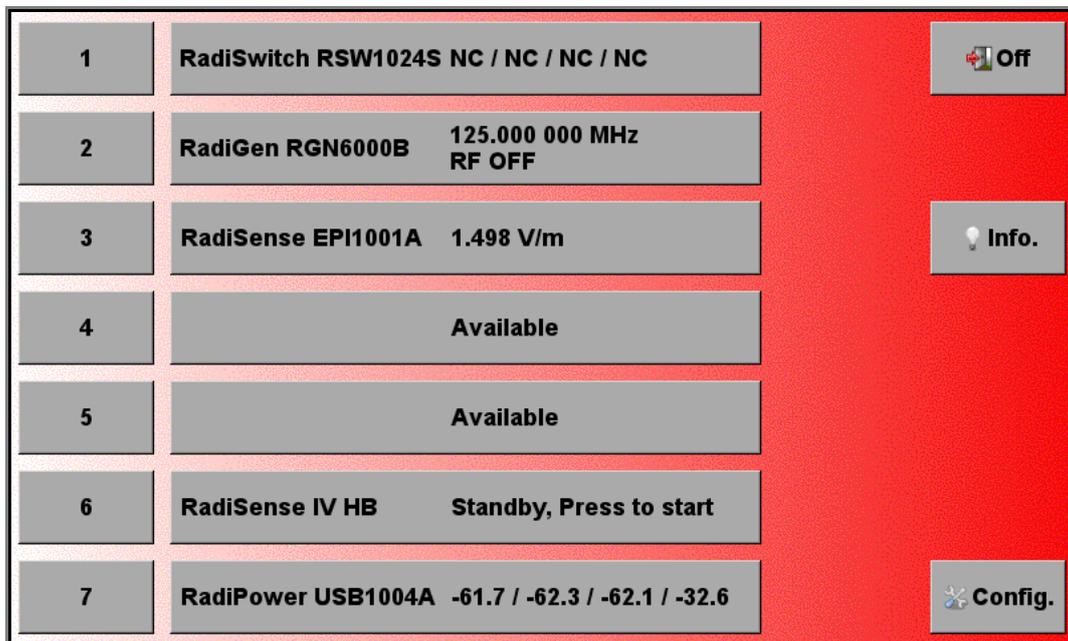
Figure 9: Example of the RadiCentre® information screen

5.2.3 'Main' screen

Figure 10 shows the 'main' screen of the RadiCentre®. This screen provides the user with an overview of the main parameters for each installed plug-in card through the slots numbers and the 'status' buttons. These can, for example, show the actual field strength for a RadiSense® field probe or the positions of the different switches in case of a RadiSwitch® plug-in card.

5.2.4 Slot numbers & 'status' button

The numbers (1 to 7) at the left hand side of the 'main' screen indicate the slot numbers of the system. If a card is present, the 'status' button will show information of the plug-in card. These indicate which cards are installed, (if any), and will bring you to a dedicated 'main status' window with all the relevant data and configuration options for that specific device. If there is no card installed the 'status' button contains the text "Available".



1	RadiSwitch RSW1024S NC / NC / NC / NC	Off
2	RadiGen RGN6000B 125.000 000 MHz RF OFF	
3	RadiSense EPI1001A 1.498 V/m	Info.
4	Available	
5	Available	
6	RadiSense IV HB Standby, Press to start	
7	RadiPower USB1004A -61.7 / -62.3 / -62.1 / -32.6	Config.

Figure 10: Example of the RadiCentre® main screen

5.2.5 Control buttons

Relevant control buttons will appear at the right hand side of the screen. These buttons are used to start the plug-in card or to control its status, depending on the card type. Please refer to the manual of the relevant card type for more information.

5.2.6 General purpose buttons

A number of general purpose buttons are present at the right side of the 'main' screen. The general purpose buttons at the right side of the screen are present in every window of the RadiCentre® (when relevant).

These include the following buttons and functions:

- 'Home' button - Pressing this button will bring you to the 'main' screen.
- 'Exit' button - Pressing this button will switch off the system and put the RadiCentre® in 'standby'.
After pressing 'exit' a confirmation window will appear. The system will not switch off before you confirm this action.
- 'Back' button - Pressing this button will bring you to the previous screen.
- 'Info.' Button - Pressing this button will bring you to the RadiCentre® information window. In this window, the software and hardware versions of the RadiCentre® are displayed.
- 'Config' button - Pressing this button will bring you to the RadiCentre® configuration window. In this window, the IEEE address of the RadiCentre® can be changed.

5.2.7 Local mode

The local control is disabled once the RadiCentre® has been operated by remote control. Local control can be regained by pressing the 'Go to local' button in the bottom-right side of the screen.

5.2.8 Configuring plug-in card parameters

When the parameters of a single card have to be adjusted, simply click on the 'status' button of that card in the 'main' screen. A dedicated configuration screen (the control screen) for that card will appear, allowing the user to change all the parameters of the relevant card. In addition, the data of the selected card will be displayed in a large font, allowing the user to monitor the data from a greater distance.

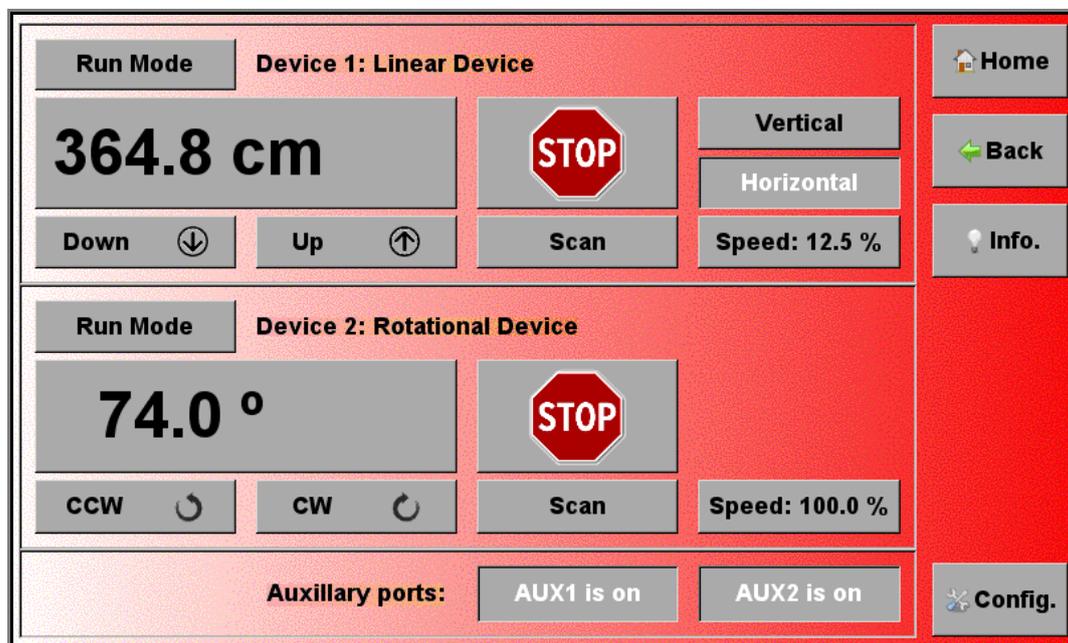


Figure 11: Example of the control screen for the RadiControl®

5.3 Remote Control of the CTR1001S

The RadiCentre® Single can be controlled remotely through either custom made software or the RadiMation® EMC software package from DARE!! Instruments installed on a PC.

Because the RadiCentre® Single only has one slot for a plug-in card, it does not use device ID's and command prefixes. The plug-in cards can be controlled using the commands described in the manual of the relevant plug-in card.

5.4 Remote Control of the CTR1009B / CTR1004B

The Standard and Lite models can be controlled remotely through either custom made software or the RadiMation® EMC software package from DARE!! Instruments installed on a PC.

Because these models can hold several plug-in cards, devices ID's and command prefixes are used. The use of Device ID's is explained in the following chapter. The command prefixes can be found in chapter 6, 'RadiCentre® Command Set'.

5.4.1 Device ID

In order to control a device mounted in the RadiCentre® from a remote computer, the address (network or GPIB) of the RadiCentre® must be set correctly. In addition, each device in the RadiCentre® has its own unique number, corresponding with the slot number of the device.

Look at the back panel of the RadiCentre® to determine the slot number of the device. When facing the back panel, the slots are numbered from left to right.

5.4.2 Device ID Example

A RadiCentre® is equipped with the following plug-in cards:

Slot nr = device ID	Port nr	Card type
1		RadiSense
2	A	RadiPower
2	B	RadiPower
2	C	RadiPower
2	D	RadiPower
3		Processor card
4		Power Supply

To remote control these devices, the user has to configure the device drivers of the external software package with the Device ID numbers as shown in the table above. If a slot supports more than one device, the device ID is the slot number, followed by the port number.

Example: To access the 2nd RadiPower® in slot 2, use device ID nr **2B**.
 To access the RadiSense® in slot 1, use device ID nr **1**.

6. RadiCentre® Command Set

6.1 Command Prefix for Plug-In Cards

All commands intended for plug-in cards, must be preceded by the slot number of the card. If a card has multiple ports, such as the USB1004A for RadiPower®, the port number must also be included in the predecessor of the command.

Example 1 - In order to request the identifier of the RadiSwitch® card in slot 3, the following command must be used:

```
3:*IDN?
```

Example 2 - To get an E-field reading from the RadiSense® card in slot 1, the following command must be used:

```
1:D2
```

Example 3 - To get a power value from the RadiPower® connected to port B of the card in slot 2, the following command must be used:

```
2B:POWER?
```

Please note that every command has to be terminated with a carriage return (CR).

REMINDER - Since the RadiCentre® Single slot version has only one slot for a plug-in card, it does not use device ID's and command prefixes. The plug-in cards can be controlled using the commands described in the manual of the relevant plug-in card.

6.2 Commands

The following table shows the general commands for the RadiCentre®. Please refer to the manuals of the plug-in cards for device specific commands.

Command	Reply	Description
"*IDN?"	"DARE!! Instruments, CTR1009B, version X.Y.Z"	Get the identification of the RadiCentre®
"STATUS?"	"OK"	Get the status of the RadiCentre® Reply is device specific
"LOCAL"		Return to LOCAL mode
"REBOOT SYSTEM"	None	Reboots the system

7. ErrorCodes

Below you find an overview of Error codes on the RadiCentre®. These error codes will be either displayed on the touchscreen of the RadiCentre® or/and on the (RadiMation®) software on with which it is operated.

7.1 Errorcode structure

The RadiCentre® can display multiple different errors. These errors are not per definition errors of the RadiCentre® but can be of other equipment attached/plugged into the RadiCentre®. The Error codes all start with a unique hundred number which shows from which source the Error originates. The Range of each the errorcodes is showed below:

Range Error codes	Device Type	Device Code
1-99	Generic Errocodes	
100-149	RadiPol / RadiSense 4 / RadiLink	
150-160	RadiLink	RLK1003A
161-199	RadiLink	RLK2003A
200-299	RadiSwitch	RSWxxxx
500-599	RadiField	RFSxxx (500 – 549 Amplifier / 550 – 574 Backplane / 575 – 599 Plug-in Card)
600-699	RadiPower	RPRxxxx
700-799	RadiSense	RSS20xx & LPS2001B
800-899	RadiControl	
1200-1299	RadiAmp	
1300-1399	RadiCentre	CTR100X
1500-1599	RadiGen	RGN2006
1600-1699	RTG	

7.1.1. Generic ErrorCodes

Range Error codes	Description
1	Wrong command
2	Parameter too high
3	Parameter too low
4	Invalid parameter
5	Buffer overflow
6	Already in progress
7	Parity error
30	I2C Timeout
31	I2C Not-Acknowledge (NACK)
32	I2C Arbitration lost
33	Not enough memory
34	Memory fault
35	Time out

7.1.2. RadiPol – RadiSense 4 – RadiLink errorCodes

Range Error codes	Description
104	Laser Under Temperature
105	Laser over temperature
106	Laser under current
107	Laser over current
108	Laser already on in standby
109	No probe connected
110	Laser turn on timeout
111	Zero
112	Laser supply on
113	CPU over temperature
114	Interlock error/ error digital link
115	Error analog link
116	Power laser 1
117	Power laser 2
118	V Low battery

7.1.3. RadiLink (RLK1003A)

Range Error codes	Description
150	Analogue laser off
151	RadiLink (RLK2003B) disconnected
152	N/A
153	RadiLink (RLK2003B) wrong answer
154	RadiLink (RLK2003B) communication busy
155	Analogue laser off through low bias. (3 times measured under the 500 uA (target is currently 800 uA), so laser is turned off.)
156	Laser off by high temperature
157	Laser off by too long no communication
158	Dac Step too high
159	Dac step too low
160	Switch not detected

7.1.4. RadiLink (RLK2003A)

Range Error codes	Description
161	RLR laser is off
162	PML communication to the RLR is busy
163	PML laser turned off through too low bias
164	RLR laser turned off through too high temperature
165	RLR laser turned off through too long no communication from the PML
166	RLR amplifier adjustment failed
167	PML laser intensity adjustment failed
168	PML laser modulation adjustment failed
169	RLR has not detected the RLS
170	RLS bias current limit hit
171	PML wrong answer from the RLR
172	RLR dac step too high
173	RLR dac step too low
174	RLS dac setting not possible
175	RLS dac failed
176	RLR dac failed
177	PML update of the parameters from the RLR timed out
178	RLR update of the parameters from the RLS timed out
179	RLR supply too low
180	PML received data frame invalid
181	RLR received data frame invalid
182	PML software update units - binary frame header invalid
183	PML software update units - binary frame header size invalid
184	PML software update units - binary frame invalid
185	PML software update units - reboot failed

186	PML software update units - sync failed
187	PML Laser adjustment failed
188	PML has not detected the RLR

7.1.5. RadiSwitch

Range Error codes	Description
201	Error Switch NC
202	Error Switch No
201 ²	Error switch Temperature NC (See note ²)
202 ²	Error Switch Temperature No (See note ²)
203	Error Temperature NC
204	Error Temperature No
205	Error Interlock
206	Error 1
206	Error 2
206	Error 3
206	Error 4
206	Error 5
206	Error 6
208	Error
209	Error extern module
210	Error no extern Connected
211	Error status unknown
212	Error current limit
213	28V Not Present

² This Error was deleted in software version 4.0.4. because the error code numbers 201 & 202, where double used. In software version 4.0.4. two new ErrorCodes are added.

In software version 4.0.0. and above these ErrorCodes are added:

Range Error codes	Description
214	Interlock 1
215	Interlock 2
216	Interlock 3
217	Interlock 4
218	Interlock 5
219	Interlock 6

In software version 4.0.4. and above these ErrorCodes are added:

Range Error codes	Description
220	RadiSwitch error switch temperature NC
221	RadiSwitch Error switch temperature NO

In software version 4.0.11. and above these ErrorCodes are removed:

Range Error codes	Description
214	Interlock 1 error
215	Interlock 2 error
216	Interlock 3 error
217	Interlock 4 error
218	Interlock 5 error
219	Interlock 6 error

An interlock error is now always:

Range Error codes	Description
205	Interlock error

This is done because it is not necessary to have an interlock error for each relay. Through the command structure you know for which relay the (interlock) error is.

7.1.6. RadiField – Amplifier - (active Antenna Array)

Range Error codes	Description
500	Already in standby mode
501	Already in operate mode
502	Already in off mode
503	Not in standby
504	Hardware failure
505	-
506	Out of Specification
507	Power Measurement, frequency not set
508	Power measurement, over range
509	Power measurement, under range
510	Power Measurement, no calibration data
511	No error logs available
512	Not for customer! (Null Pointer)
513	First send the startup command
514	Already started
515	Regulating FET
516	3V3 out of range
517	5V out of range

518	12V out of range
519	-12V out of range
520	50V out of range
521	Driver 3 current out of range
522	Final Current out of range
523	Temperature out of range
524	Power out of range
525	Driver 3 fet adjustment error
526	Final fet adjustment error
527	Going to standby
528	Going to operate
529	Going to of
530	Oven too cold
531	Oven too hot
532	Calibrating busy
533	Power not updated
534	Driver 3 Supply volt out of range
535	Driver 2 current out of range
536	Drive 2 Adjustment error

7.1.7. RadiField - Backplane - (active antenna array)

Range Error codes	Description
551	Communication busy
552	Amplifier error
553	Amplifier wrong *IDN
554	Amplifier wrong answer
555	Amplifier time-out
556	Amplifier wrong mode
557	No amplifier connected
558	Received command length are no digits
559	Received command length incorrect
560	Communication amplifiers failed
561	Polarizer not detected
562	Polarizer current too high
563	Polarizer H-bridge fault
564	Polarizer strength too high
565	Polarizer speed too low
566	Polarizer wrong direction

7.1.8. RadiField – Plug-in Card – (Active antenna array)

Range Error codes	Description
504	Hardware failure
570	The external unit is not connected. Communication test failed also on 50V
571	Communication Timeout - The Value isn't updated (through the data frame) within the timeout time.
572	One or more amplifiers are in error mode but in status no error is found
573	Received invalid data of the backplane in the sync command (50V or data frame)
574	Maximum number of retries reached on communication over the link
575	Communication busy
576	Communication timeout
577	Power supply already on
578	Power supply off
579	Incorrect impedance
580	Impedance short
581	Impedance open
582	External unit is not connected. Communication failed on 5V.
583	-
584	SW Update – 50V backplane not of
585	SW update – 50V backplane not on
586	SW Update – software downloads not started
587	SW update – Sync retries failed
588	SW update – reboot unit failed
589	SW update – amplifier to off mode error
590	SW update – transparent mode on error
591	SW update – transparent mode off error
592	SW Update – binary frame error
593	SW Update -Binary frame Header error
594	SW update – Binary frame header size error
595	Illegal backplane command length
596	Length error – received command length no digits
597	Length error – received command length incorrect
598	Mains on sequence error – BPL 50V switch error
599	Mains on sequence error – AMP startup error.

7.1.9. RadiPower

Range Error codes	Description
601	Error frequency not set
602	Error over range
603	Error under range
604	No cal data
605 ²	External trigger pin error
606 ²	Command not supported in the mode
607 ²	Combination measure speed and time not allowed. On 1MS/s the maximum measure time ins 32 seconds. At 5MS/s the maximum measure time is 6.2 seconds.

² The Code is only available in the RPR3000 Series

7.1.10 RadiSense – LPS2001B

Range Error codes	Description
700	Wrong identifier
701	Invalid target
702	Probe invalid reply
703	No update in time (Field is questioned but there is no valid field of the probe received in time.)
704	Invalid data frame received
705	Probe not connected
706	MSP interlock tripped
707	Laser off through time out (Communication time out or startup probe timed out that caused laser to shut off)
708	Error during justation store
709	Software update fault
710	Flash fault
711	Serial Number fault
712	PWM fault
713	ADC fault
714	Binary data fault
715	Dump not received ok
716	Card type unknown
717	Probe type unknown
718	Safety controller card type fault
719	Safety controller probe type fault
737	Data frame CRC incorrect
738	Start aborted by user
739	Command not supported in software update mode

740	MSP too long no communication probe (longer than 5 ms)
741	SC IDN fault
742	SC HW version fault
743	SC not received start on RS232
744	SC not received start on USB
745	SC not received start on button
746	SC switch 2 not high
747	SC switch 2 not low
748	MSP switch 1 fault
749	MSP switch 2 fault
750	SC not responding
751	(not in use)
752	SC invalid reply
753	Laser turned on
754	3V3 out of range
755	5V out of range
756	12V out of range
757	Laser current out of range
758	Laser temperature out of range
759	Trigger not received
760	SC (Safety Controller) - too long no communication with Probe
761	SC (Safety Controller) - MSP switch 1 not high
762	SC (Safety Controller) - MSP switch 1 not low
763	SC (Safety Controller) - switch 1 fault
764	SC (Safety Controller) - switch 2 faults
765	SC (Safety Controller) - MSP not questioning
766	SC (Safety Controller) - interlock tripped
767	SC (Safety Controller) - Trigger received outside window
768	SC (Safety Controller) - Start source not received
769	SC (Safety Controller) - Trigger not received
770	SC (Safety Controller) - Current out of limits
771	SC (Safety Controller) - 3V3 LPC out of limits
772	SC (Safety Controller) - 3V3 MSP out of limits
773	Startup sequence busy, command currently not allowed
774	Not supported by probe type
775	Received during start invalid data

7.1.11 RadiSense - Probe

Range Error codes	Description
720	Justation already stopped
721	Potmeter fault
722	Justation point of 0 V/m not available
723	No valid calibration data available
724	Frequency lower than calibration table
725	Frequency higher than calibration table
726	No points stored
727	Justation fault
728	Calibration fault
729	Temperature correction fault
730	Flash fault
731	Serial number fault
732	Justation field not monotone
733	Justation adc not monotone
734	Not allowed for probe type
799	Potentiometer offset store busy
798	Potentiometer offset build busy
797	Potentiometer offset temperatures not monotone

7.1.12. RadiSense - Laser Power Supply

Range Error codes	Description
726	Zero Busy
750	Probe not connected
751	Laser error
752	Flash operation too long
753	Zero operation too long
754	Probe busy
755	Probe in dump mode
760	Laser is starting
761	Laser is already on
762	Laser is already off

7.1.13. RadiControl

Range Error codes	Description
800	Speed min equal or higher than speed max
801	Speed max equal or lower than speed min

7.1.13 RadiAmp

Range Error codes	Description
1200	Already in standby
1201	Already in operate
1202	Already in off
1203	Not in standby
1204	Out of specification
1205	Null pointer
1206	Startup first
1207	Already started
1208	Regulating FET
1209	3V3 out of range
1210	5V out of range
1211	12V out of range
1212	-12V out of range
1213	24V out of range
1214	37V out of range
1215	Driver current out of range
1216	Final current out of range
1217	Temperature out of range
1218	Adjusting driver
1219	Adjusting final
1220	Going to standby
1221	Going to operate
1222	Going to off
1223	Oven too cold
1224	Oven too hot
1225	Calibrating busy

7.1.14 RadiCentre

Range Error codes	Description
1300	Software upgrade in progress
1301	Slot Preserved for 2090 Emulation mode
1302	RadiCentre interlock tripped
1303	RadiCentre is still initializing

7.1.15 RadiGen - RGN2006

Range Error codes	Description
1500	Documentation is not complete, still needs to be filled in.

7.1.16 RTG

Range Error codes	Description
1600	Current limit during startup
1601	Current limit during leveling
1602	Error during start up
1603	Overheating
1604	Undefined state
1605	Dac in fixed state

RadiCentre® Specifications

Model	CTR1001S	CTR1004B	CTR1009B
Performance			
Number of free slots Available for cards	1	2	7
Display	NA	7" LCD with touchscreen	
Backplane		Intelligent versatile backplane	
Processor card		CPU with onboard RAM and Flash	
Operating System		Linux	
Model	Desktop	Desktop or 19" rack mountable	
Dimensions			
Height	50 mm	132 mm (3U)	
Depth	254 mm	312 mm excluding projections	
Width	180 mm	19" (rack mountable)	
Weight	1,4 kg	Approx. 7 kg (empty)	
Environmental conditions			
Temperature range	10° C - 40° C		
Relative humidity	10% - 90% (non-condensing)		

**This table continues on the next page.*

RadiCentre® Specifications, part 2

Model	CTR1001S	CTR1004B	CTR1009B
Power consumption			
Supply voltage	12 VDC	115 VAC (60Hz) / 230 VAC (50Hz)	
Standby mode	NA	< 1 W	
Operating (no cards)	NA	33 W	
Operating (maximum)	24 W	60 W	200 W
Interfaces & cables			
Interface	RS-232 & USB	USB and LAN. Optional IEEE-488 (GPIB)	
Connectors	DC-Power, Sub D-9, USB-B 1.1	IEC Inlet, 2x USB-A 2.0, USB-B 1.1, LAN, IEEE-488 (optional) and Interlock	
Cables	RS-232 cable, AC/DC Adapter	USB cable, IEC power cord	
Safety			
Interlock	External Interlock & Interlocked LASER outputs		
Warranty			
Warranty	3 years (misuse excluded)		
Plug-in cards			
RadiControl®	Antenna Tower and Turntable controller		
RadiGen®	Range of RF signal generators up to 6 GHz for EMC applications		
RadiPower®	Range of power meters up to 18 GHz for EMC applications		
RadiSense®	LASER powered range of EM Field Sensors (4, 6 and 18 GHz)		
RadiSwitch®	Switch one, two, four or six RF signals up to 40 GHz		
RadiLink®	A range of analogue fiber optic RF links up to 3 GHz		
RadiField®	A range of electric field generators from 1 to 6 GHz		

WARRANTY CONDITIONS

DARE!! Instruments offers a standard warranty term of three years on their products, starting from the shipping date. This warranty is applicable to all EMC test & measurement products, such as:

- RadiCentre® modular / multifunctional EMC test systems
- RadiControl® antenna tower/turntable controllers
- RadiField® Triple A field generators
- RadiGen® signal generators
- RadiPower® RF power meters
- RadiSense® laser powered E-field probes
- RadiSwitch® RF coaxial switches

If a defect occurs within the warranty term, a Return Material Authorization (RMA) 'Warranty Repair' request can be issued using the RMA link at <http://rma.dare.eu>. The defective product can then be shipped to DARE!! Instrument for repair by our service department.

There will be no charge for repair services (materials or labor) within the warranty term. The customer will need to cover the costs for returning the product to DARE!!, such as shipping and/or any applicable duties and taxes. DARE!! Instruments will arrange the courier and cover the costs for the return shipment.

These warranty terms are not applicable to:

- Fiber optic cables
- Products that have been improperly used
- Products that have been used outside their specified range
- Products that have been improperly installed and/or maintained
- Products that have been modified without approval of DARE!! Instruments
- Calibration and/or re-calibration of the product
- Consumable products such as batteries, ink etc.

Repair services on products that are not covered by the DARE!! warranty will be charged to the customer. If a defect occurs to our product outside the warranty period, a RMA repair and/or re-calibration request must be issued using the RMA link at <http://rma.dare.eu>.

The repairs (outside the original warranty period) have a warranty limited to six months. Shipping conditions are the same as with repairs within the original warranty period.

EUROPEAN DECLARATION OF CONFORMITY

We, DARE!! Instruments, declare under our sole responsibility that the product;

RadiCentre®

Models CTR1009B, CTR1004B and CTR1001S

to which this declaration relates, is in accordance with the following Directives:

EMC-Directive 2014/30/EU
Low Voltage Directive 2015/35/EU
RoHS-Directive: 2011/65/EG

Per the provisions of the applicable requirements of the following harmonized standards:

Emission: EN 61326-1:2013, Class A¹
Electrical equipment for measurement, control and laboratory use.
Immunity: EN 61326-1:2013, Industrial level, performance criteria A
Electrical equipment for measurement, control and laboratory use.
Safety: EN 61010-1:2010, Safety requirements for electrical equipment
for measurement, control, and laboratory use

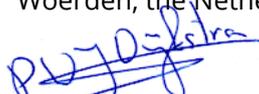
The Technical Construction Files are maintained at;

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Date of issue: July 17th, 2017

Place of issue: Woerden, the Netherlands

Authorized by:


P.W.J. Dijkstra

Title of authority: Director

¹ Conducted emission complies with Class B (household equipment)

